The Thought Uniqueness Hypothesis
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We propose a ban of equivalent, but more complex LF representations constructed from the same lexical concepts as a simpler one. The ban can be seen largely as an extralinguistic condition, but subsumes two lines of work previously seen as conditions applying within the language system, namely interpretive economy of Fox (2000) and restrictions on semantic type-flexibility by Heim (2017) and Hirsch (2016, 2017). Our unification also makes better empirical predictions and allows a link to recent work on scalar alternatives.

Proposal We formulate the Thought Uniqueness Hypothesis (TUH) in (1) as a ban on LF representations that are unnecessarily complex, whereby specifically we refer to the length of variable binding dependencies (Fox 2000).

(1) **TUH** An interpretable LF representation B is banned if an LF representation A exists with:
   a. A consists only of lexical terminals of B and any λ-operators and variables
   b. \[[A]=[[B]]\]
   c. A has lower dependency complexity \(DC\) than B (i.e. \(DC(A) < DC(B)\)).

For concreteness, we assume that dependency complexity grows exponentially by doubling for each branching node on the path between an occurrence of a variable and its binder:

(2) **Dependency Complexity (DC)** Let \(\text{var}(A)\) be the set of occurrences of bound variables in A and \(\text{len}(x)\) be the number of branching nodes between a single occurrence \(x \in \text{var}(A)\) and its binder \(\lambda x\). Then we define the dependency complexity of A as:

\[
\text{DC}(A) = \sum_{x \in \text{var}(A)} 2^{\text{len}(x)}
\]

**Binding Economy** Dahl (1974) observes that the sentence in (3a) followed by ellipsis *Bill does too* lacks an interpretation where the first pronoun receives a sloppy interpretation and the second a strict interpretation. Fox (2000) accounts for Dahl’s observation by means of ruling out long binding as in (3b) when local binding as in (3a) is possible. In (3), we indicate the relevant dependencies and, for some, their length to demonstrate that Fox’s account can be subsumed under the TUH.

(3) a. John \(\lambda_1\) said that he \(\lambda_2\) 2 likes his \(\lambda_2\) mother \(\text{DC} = 2^4+2+2+4+2 = 36\)
   b. *John \(\lambda_1\) said that he \(\lambda_1\) likes his \(\lambda_1\) mother \(\text{DC} = 2^6+2^4+2 = 82\)
    
Reconfigurations of (3b) (regardless of syntactic plausibility) cannot reduce DC below that of (3a), e.g.:

(3) c. *John \(\lambda_1\) said that he \(\lambda_1\) his \(\lambda_2\) 2’s mother \(\text{DC} = 2^5+2^4+2+2^2 = 54\)

**Blocking Geach: Raising verbs** The Geach rule (Geach 1972, Jacobson 2014) applies to a function of type \(⟨\alpha,\beta⟩\) to derive one of type \(⟨\gamma\alpha,\gamma\beta⟩\). But Heim (2017, building on Dowty 1985, Jacobson 1990) argues though that raising verbs like *seem* (type \(⟨st,st⟩\)) cannot be Geach-lifted to the type of a control verb \(⟨est,est⟩\). One argument of Heim’s rests on the contrast between control verbs in (4a) and *seem* in (4b) with null-complement anaphora.

(4) a. Mary tried/wanted to float. Bill tried/wanted too.
   b. Mary seemed/appeared to float. *Bill seemed/appeared too.
The general Geach rule corresponds to the $\lambda$-term in (5) (specifically $G_{est,st}$ is relevant here). Any Geach rule has a fixed DC of 20. Therefore the raising representation (5a) with DC 4 blocks the control representation (5b).

\[(5) \quad G_{\alpha,\beta}^{\gamma} = \lambda_{1}^{(\alpha,\beta)} \lambda_{2}^{(\gamma,\beta)} \lambda_{3}^{\gamma} \quad \text{DC} = 2 \times 2^3 + 2^2 = 20\]

\[(6)\]

a. Mary $\lambda_1$ seemed/appeared $t_1$ to float  \[\text{DC} = 4\]

b. $*\text{Mary} [G_{est,st}(\text{seemed/appeared}) \text{ to float}] \quad \text{DC} = 20\]

**Allowing Lexicalized Geach: ‘little’** Heim (2017) argues that predicate negation (type $\langle et, et \rangle$) is also not available. To explain this her type economy principle blocks any lexical entry that is definable from boolean negation (type $\langle t, t \rangle$) and a Geach rule. However, Heim herself (2006, 2008) and Büring (2007) argue that little should be analyzed as a negation of type $\langle dt, dt \rangle$. Heim’s (2006) analysis is inconsistent with Heim’s (2017) proposal, but consistent with the TUH since little is a different lexical concept from not.

**Scope Economy** The scope restriction in (7) from Fox (2000) and many similar cases can also be subsumed under the TUH:

\[(7) \quad \text{Some boy admires every teacher. Every girl does too. (some} \gg \text{every, } *\text{every} \gg \text{some)}\]

We propose that transitive verbs are of type $\langle e, est \rangle$. The world argument being outer-most requires a Geach rule application for ‘in situ’ interpretation of both subject (once) and object quantifiers (twice) (see (8c) and (8d)). Furthermore two shorter dependencies as in (8a) are preferred over on longer one as in (8b). (8b) is available for inverse scope of non-commutative quantifiers.

\[(8)\]

a. every girl $\lambda_1$ every teacher $\lambda_2$ w [ 1 admires 2 ]  \[\text{DC} = 2^3 + 2^2 = 12\]

b. *every teacher $\lambda_2$ every girl $\lambda_1$ w [ 1 admires 2 ]  \[\text{DC} = 2^1 + 2^4 = 18\]

c. *every girl $\lambda_1$ w [1 admires $G_{est,st}[G_{est,t}[\text{every teacher}]]$]  \[\text{DC} = 2^2 \times 20 + 2 = 22\]

d. *w $G_{est,t}[\text{every girl}]$ admires $G_{est,st}[G_{est,t}[\text{every teacher}]]$  \[\text{DC} = 3^3 \times 20 = 60\]

**Conjunction Reduction** Hirsch (2017) derives that both (9a) and (9b) lack a wide scope interpretation of and from the assumption that and must receive a type $\langle t, tt \rangle$ interpretation (in addition to scope economy applying in each conjunct).

\[(9)\]

a. Some company hired a maid and fired a cook. (some $\gg$ and, $*\text{and} \gg \text{some}$)

b. Some company hired a maid and a cook. (some $\gg$ and, $*\text{and} \gg \text{some}$)

Hirsch’s LF-representations for (9b) is shown in (10a) and the Geach alternative in (10b). Hirsch’s data can be subsumed under the TUH if we assume that the two occurrences of $t_1$ in (10a) that are bound ATB in parallel only contribute once to dependency complexity.

\[(10)\]

a. Sm co. $\lambda_1$ [a maid $\lambda_2$ w $t_1$ hired $t_2$] and [a cook $\lambda_2$ w $t_1$ hired $t_2$]  \[\text{DC} = 2^2 \times 3^3 + 2^5 = 48\]

b. $*\text{Sm co.} \lambda_1$ [a maid $G_{t,t}(\text{and})$ a cook] $\lambda_2$ w $t_1$ hired $t_2$  \[\text{DC} = 20 + 2^3 + 2^5 = 60\]

[Not shown in detail: Like Hirsch we need to limit the domain of TUH to individual conjuncts.]

**Further Support** The TUH replaces two previously established linguistic assumptions with a novel perspective. If we identify LF representations with language-independent thought, the TUH argues that thought representations are built for efficiency independent of communication (Berwick & Chomsky 2015). Furthermore, the TUH might be derived from application of exhaustification of a B where even an equivalent alternatives A with lower DC must be excluded (cf. Fox and Katzir 2011). Any representation B banned by TUH would then trigger an obligatory contradiction: $B \land \neg A$, while $[A] = [B]$. 
References


